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Docket No.: 53674-015

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Hitoshi SUMIYA, et al.

Serial No.: 09/462,876

Group Art Unit: 1755

Filed: January 18, 2000

Examiner: K. Group

For: CUTTING TOOL OF A CUBIC BORON NITRIDE SINTERED COMPACT

REPLY BRIEF

Commissioner for Patents  
Washington, DC 20231

Sir:

This Reply Brief is submitted in response to the Examiner's Answer dated November 19, 2002.

**ARGUMENTS**

Appellants submit that the Examiner's rejections under 35 U.S.C. §102 and 35 U.S.C. §103 are legally erroneous for the reasons set forth in the Appeal Brief submitted September 23, 2002 and for the reasons set forth hereinafter. In fact, the Examiner's Answer merely exacerbates the lack of any basis upon which to invoke the doctrine of inherency.

**Undisputed Facts**

It is undisputed by the Examiner that the present invention addresses and solves problems attendant upon the use of cubic boron nitride sintered compact tools, including breakage due to lowering of the strength with increased cutting edge temperatures during cutting and thermal cracking thereby lowering tool life. It is also undisputed by the Examiner that the present invention addresses and solves the difficulty of sharply finishing the cutting edge without chipping, thereby rendering it difficult to employ cutting tools for precision cutting tool operations.

It is also undisputed by the Examiner that Appellants discovered that cubic boron nitride sintered compacts compressed by ultra-high pressure exhibit an anisotropic properties resulting in laminar cracking or stripping, as disclosed in the second full paragraph on page 5 of the written description of the specification.

The Examiner does not dispute the fact that Appellants address and solve such problems by subjecting low crystallinity boron nitride or fine grain, normal pressure type boron nitride free from adsorbed gases or boron oxide, as a starting material, to direct conversion into cubic boron nitride followed by sintering at high pressure and temperature. As pointed out in the paragraph bridging pages 2 and 3 of the Appeal Brief, the resulting cutting tool exhibits an average grain diameter no greater than 1 micron, a particular diffraction intensity ratio indicative of anisotropic properties, a minimum transverse rupture strength and a particular thermal conductivity at the edge part. These limitations are recited in independent claim 1.

The Examiner does not point to any evulcation in any of the applied references where any of these undisputed significant limitations appear. The Examiner says they are inherent in the prior art.

**There is no inherency.**

In order to rely upon the doctrine of inherency, the Examiner has the initial burden of specifically identifying a factual basis in an applied reference upon which to predicate the determination that allegedly inherent features, in this case the undisputed significant limitations appearing in claim 1 with respect to the diffraction intensity ratio indicative of anisotropic properties, the minimum transverse rupture strength and the particular thermal conductivity at the edge part, **necessarily** exist in the prior art cutting tools and that such would have recognized by one having ordinary skill in the art. *Elan Pharmaceuticals Inc. v. Mayo Foundation*, \_\_\_ F.3d \_\_\_, 64 USPQ2d 1292; *Crown Operations International Ltd. v. Solutia Inc.*, 289 F.3d 1367, 62 USPQ2d 1917 (Fed. Cir. 2002).

The reasons offered by the Examiner would, in effect, deny Appellants due process of law. Specifically, in the ultimate paragraph on page 5 of the November 19, 2002 Answer, the Examiner says that the prior art cubic boron nitride bodies are "... processed under temperature and pressure conditions **not unlike** that utilized by the instant invention" (emphasis applied). The Examiner also notes that testing facilities are not available at the U.S. PTO. The second reason, of course, can be used arbitrarily to shift the burden to an applicant in any case but does not alleviate the Examiner's initial burden of providing some technological rationale upon which to shift the burden. That rationale is not satisfied by stating that the prior art fabricating techniques are "not

unlike" the techniques employed in the present invention. "Not unlike" does not inspire the requisite certainty and art recognition. This shortcoming is exacerbated by the objective evidence of record showing that all sintered cubic boron nitride bodies having overlapping compositions and grain sizes do **not necessarily** exhibit the same diffraction intensity ratio, thermal conductivity and transverse rupture strength, let alone as specified in claim 1, regardless how they may have been fabricated and processed, as would have been understood by one having ordinary skill in the art.

### **The Objective Evidence of Record**

On pages 9 and 10 of the Appeal Brief, Appellants argued that the evidence in the specification, notably Tables 2 through 6, undermine the factual determination of inherency by demonstrating that cutting tool properties of sintered cubic boron nitride tools depend upon, inter alia, the selection of the starting material, conversion temperature and centering temperature. Appellants would again note that the data in Tables 2 through 6 demonstrate that the breakage resistance of samples (comparative Example 2) is so low that they could not function as a cutting tool in any of the reported tests in which the diffraction intensity ratio is at 0.02, i.e., outside the scope of the present invention. Adverting to Table 2, for example, it is apparent that pBN as a starting material resulted in laminar cracking or peeling leading to early breakage at the edge because of the strong orientation of the crystal grains.

Significantly, the Examiner **admits** that sintering time impacts the properties of the sintered article (first paragraph on page 6 of the November 19, 2002 Answer). The point is the evidence demonstrates that various conditions impact the properties. This is

enough to undermine the notion of inherency which requires **certainty**, not happenstance.

*Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); *W. L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983); *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 20 USPQ2d 1746 (Fed. Cir. 1991); *In re Oelrich*, 666 F.2d 578, 212 USPQ 323 (CCPA 1981).

The Examiner plays down the data in the specification asserting that it was not generated under conditions corresponding to those employed in the applied references. The Examiner misses the point. The evidence in the specification and Declaration under 37 C.F.R. §1.132 were not relied upon for their knockdown capacity with respect to an obviousness rejection. Rather, the data in the specification and Declaration were relied to demonstrate that it can **not be assumed** that the sintered compacts of the prior art **necessarily** exhibit the same diffraction intensity ratio, thermal conductivity and transverse rupture strength, let alone as specified in claim 1, regardless of how they may have been fabricated and processed, and that such would have been recognized by one having ordinary skill in the art. Again, the evidence clearly demonstrates that the selection of the particular starting material, conversion temperature and sintering temperature all impact the resulting properties leading to the particular characteristics recited in independent claim 1. The Examiner assumes that all the right conditions would be selected, such as the fortuitous election of the proper starting material, the fortuitous selection of the right conversion temperature, and fortuitous election of the right sintering temperature, all in combination. Such **assumptions** undermine the notion of inherency which requires **certainty**. *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*,

*supra*; *In re Rijckaert, supra*; *W. L. Gore & Associates, Inc. v. Garlock, supra*);  
*Continental Can Co. USA, Inc. v. Monsanto Co., supra*; *In re Oelrich, supra*.

As to the alternative rejection under 35 U.S.C. §103, Appellants would again point out that the Examiner has not even attempted to state a *prima facie* basis to deny patentability under that statutory provision. No factual determinations have been made with respect to the scope and content prior art, level of ordinary skill in the art, any difference between the claimed invention and the applied prior art, or attribute any consideration to the indicium of nonobviousness of record. Certainly, the Examiner has not made a "thorough and searching" factual inquiry and, based upon that factual inquiry, explain why one having ordinary skill in the art would have been realistically motivated to modify the sintered products of any of the applied references to arrive at the claimed invention. *In re Lee*, 237 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002).

As to the rejection of claims 9 and 10 under 35 U.S.C. §103, Appellants would rely upon the arguments commencing at page 12 of the Appeal Brief. Appellants would note the Examiner admitted Kawasaki et al. disclose the use of hBN particles to produce sintered bodies. Appellants submit that it is inconceivable that one having ordinary skill in the art would have **stopped** the methodology of Kawasaki et al., surgically extract the hBN particles disclosed by Kawasaki et al. as suitable to for sintering, and then employ them in methodology disclosed by Suzuki et al.. The only apparent motivation is improperly extracted from Appellants' disclosure. *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985). The Examiner's focusing on properties that Kawasaki et al. disclose as useful for processing hBN particles into sintered bodies

and asserting utility in the methodology of Suzuki et al. is without the requisite factual basis. As held by the Court of Appeals for the Federal Circuit in *Teleflex Inc. v. Ficosa North America Corp.* \_\_\_F.3d\_\_\_, 63 USPQ2d 1374, 1378 (Fed. Cir. 2002):

The showing of a motivation to combine must be clear and particular, and it must be supported by actual evidence.

The Examiner points no evidence, but merely injects his personal assessment of such properties after consulting Appellants' disclosure. *Panduit Corp. v. Dennison Mfg. supra.*

The Examiner also ignores the fact that Suzuki et al. employ pBN particles to obtain a cBN sintered compact which is highly oriented-- an objective of Suzuki et al. manifestly ignored by the Examiner. Further, as to the nonobviousness issue, the Examiner has not disputed the fact that the present invention addresses and solves problems which the Examiner has been unable to identify in the applied references, and that the limitations appearing in claim 1, which the Examiner says are inherent, are significant in solving such problems. In other words, the Examiner has not disputed the fact that the problems addressed and solved by the claimed invention constitute an indicium of **nonobviousness**. *North American Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989).

### **Conclusion**

Appellants submit that for the reasons set forth in the Appeal Brief, and for the reasons set forth herein the imposed rejections under 35 U.S.C. §102 and 35 U.S.C. §103

are not factually and legally viable. Appellants, therefore, respectfully solicit the Honorable Board to reverse each of the Examiner's rejections.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

A handwritten signature in black ink, appearing to read 'A. J. Steiner', with a stylized flourish at the end.

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